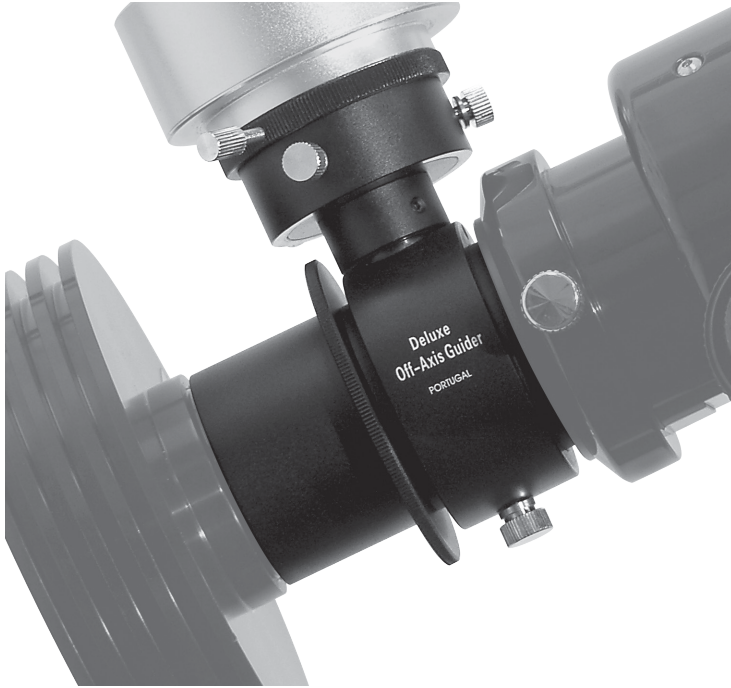


# INSTRUCTION MANUAL

## Orion® Deluxe Off-Axis Guider

#5521



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**Figure 1a.**

*Congratulations on your purchase of the Orion Deluxe Off-Axis Guider.* This useful imaging accessory enables you to image and guide through the same telescope, thereby eliminating the need for a separate guide scope which also saves weight on your mount. The Deluxe Off-Axis Guider is especially useful for Schmidt-Cassegrain telescopes or other systems that are prone to optical flexure or mirror shift. Since the autoguider detects the exact same movement as the imaging camera, you are assured highly-accurate tracking.

## **Parts List**

1. Deluxe Off-Axis Guider Main Body
2. 2" Nosepiece
3. 30mm Extension
4. 17mm Extension
5. 7mm Extension
6. Fine Focus Guiding Adapter and 1.25" Eyepiece Holder
7. Rotate Lock Ring
8. Hex Key

# 1. Getting Started

The Deluxe Off-Axis Guider comes with all of its parts already attached; however, you should remove the parts first because you may not have to use all of them to guide with your particular telescope, camera, and autoguider. Please take a moment to familiarize yourself with the parts (Figure 1a and 1b).

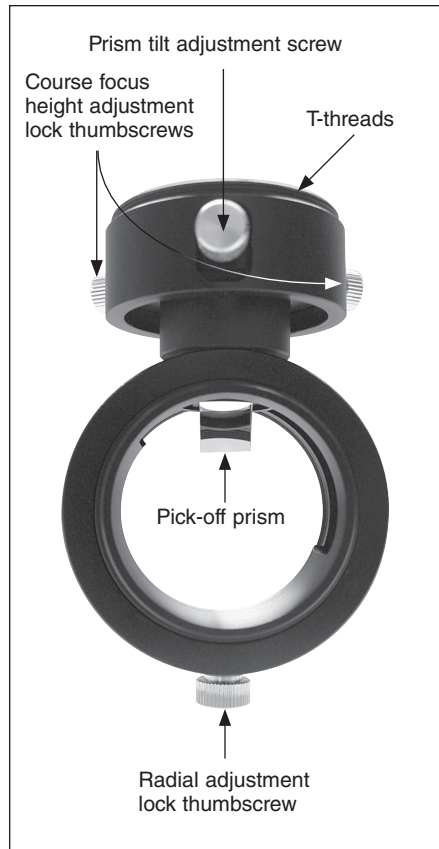
The Deluxe Off-Axis Guider accommodates nearly any imaging camera and autoguider. We recommend using a compact autoguider, such as the StarShoot AutoGuider; however many other autoguider cameras with a 1.25" nosepiece or female T-threads are also appropriate. You can also use any 1.25" eyepiece to help visually locate a guide star before attaching the autoguider. Manually guiding with a 1.25" reticle eyepiece is possible too.

## Setting the Correct Imaging Camera and Autoguider Spacing

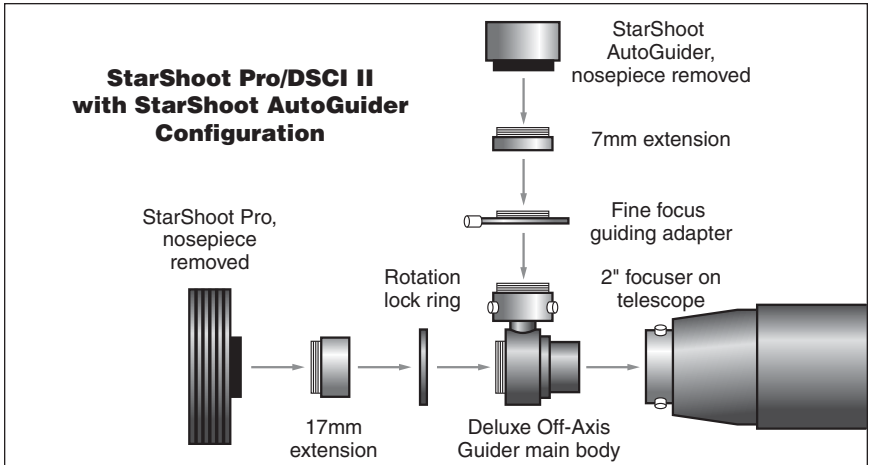
The imaging camera and autoguider must come to the same focus point to successfully operate the Deluxe Off-Axis Guider. The imaging chip in your CCD or DSLR camera and the detector in your autoguider must be equidistant to the focal plane of your telescope. Three extension pieces (30mm, 17mm, and 7mm) are included to allow you to achieve focus with both your imaging camera and autoguider when using the Deluxe Off-Axis Guider.

If you are imaging with the StarShoot AutoGuider and the StarShoot Pro, StarShoot Pro V2.0 or a Canon or Nikon DSLR, please refer to Figures 2a-2c for the suggested Deluxe Off-Axis Guider configuration.

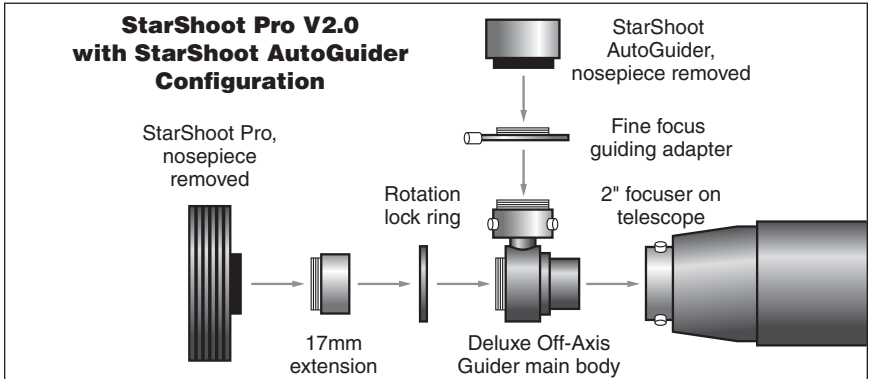
For any other imaging setup, you must determine the correct spacing configuration to allow your autoguider and imaging camera to reach focus. Keep in mind that the farther away the imaging camera's chip is from the Deluxe Off-Axis Guider, the farther away the autoguider detector must also be.



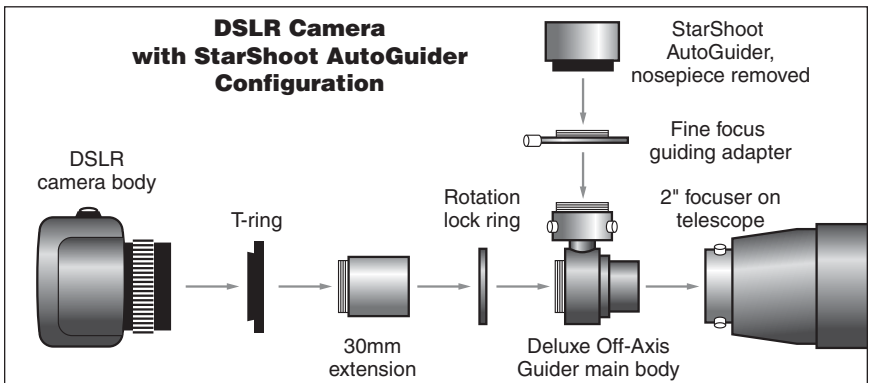
**Figure 1b.** The main body of the Deluxe Off-Axis Guider contains the guiding end which enables guide star acquisition and focus.



**Figure 2a.**



**Figure 2b.**



**Figure 2c.**

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## 2. Attaching the Imaging Camera to the Deluxe Off-Axis Guider

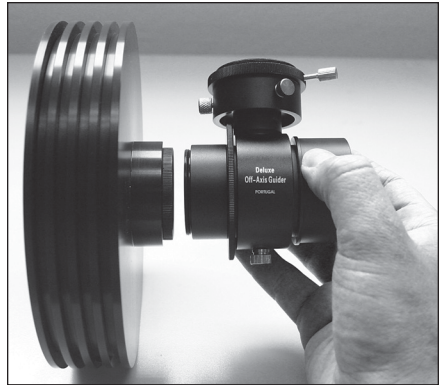
Once you have estimated what the approximate spacing configuration should be, you are ready to attach the Deluxe Off-Axis Guider to your imaging camera. Simply thread the imaging camera's female T-threads into the back of the Deluxe Off-Axis Guider (Figure 3). You can optionally use the rotate lock ring to fix the orientation of the Deluxe Off-Axis Guider in relation to the camera. This can be particularly useful for DSLRs because the guider's radial adjustment sometimes interferes with the camera body.

### Using a StarShoot Deep Space Imaging Camera

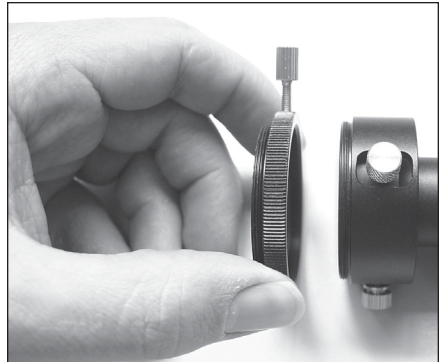
Thread the camera to the Deluxe Off-Axis Guider as shown in Figure 3.

## 3. Attaching the Autoguider to the Deluxe Off-Axis Guider

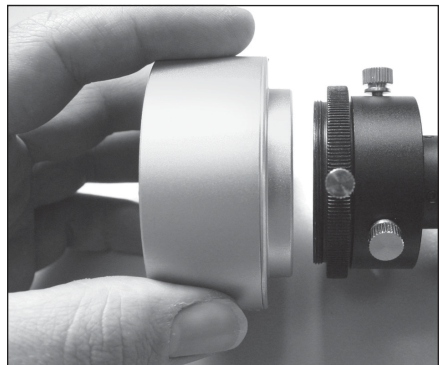
Thread the fine focus guiding adapter to the guiding end of the Deluxe Off-Axis Guider; then tighten the fine focus lock thumbscrew (Figure 4a). Next, thread the autoguider camera body to the Deluxe Off-Axis Guider (Figure 4b).



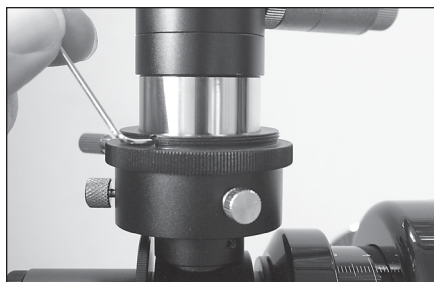
**Figure 3.** Thread the imaging camera into the Deluxe Off-Axis Guider. If you are using a DSLR, the T-ring should already be attached to the camera body.



**Figure 4a.**



**Figure 4b.**



**Figure 5.** Use the socket head setscrew and hex key to secure the autoguider nosepiece or 1.25" eyepiece.



**Figure 6.** Deluxe Off-Axis Guider direct T-thread attachment to the telescope.

### **Using the 1.25" Eyepiece Holder**

The fine focus guiding adapter also functions as a 1.25" eyepiece holder to support cameras that use only a 1.25" nosepiece or any standard 1.25" eyepiece. Insert the camera nosepiece or eyepiece barrel into the 1.25" holder. Locate the socket head setscrew and secure the camera or eyepiece using the provided 1.5mm hex key (Figure 5), also refer to "Finding and Focusing a Guide Star".

## **4. Attaching the Deluxe Off-Axis Guider to a Telescope**

The Deluxe Off-Axis Guider is equipped with a standard removable 2" nose piece and female camera T-threads, ready to attach to most telescopes. You can either insert the Deluxe Off-Axis Guider like an eyepiece using the 2" nosepiece, or attach it directly to your imaging scope's T-threads (if equipped) for a direct threaded connection.

### **Using the 2" Nosepiece**

If your telescope features a 2" focuser or adapter, the easiest way to attach the Deluxe Off-Axis Guider is by using the included 2" nosepiece. Simply insert the nosepiece into your telescope's 2" focuser or accessory and secure it by tightening the thumbscrew.

### **Using T-threads**

Some Orion telescopes feature focusers with male T-threads. If you are using such a telescope, you can attach the Deluxe Off-Axis Guider body directly to the T-threads without using the 2" nosepiece. Remove the 2" nosepiece. Then carefully thread the Deluxe Off-Axis Guider body to the T-threads (Figure 6).

The assembled setup when attached to the telescope will resemble Figure 7.



**Figure 7.** The Deluxe Off-Axis Guider, imaging camera, and autoguider are properly attached to the telescope.

## 5. Focusing and Finding a Guide Star

When your imaging camera and autoguider are attached and the Deluxe Off-Axis Guider is connected to your telescope, you are ready to begin focusing and finding a guide star. The Deluxe Off-Axis Guider features coarse and fine focus adjustments for the guiding end. The coarse adjustment is made by sliding the guiding end up and down and locking the position with two thumbscrews (Figure 8). The fine focus adjustment is made by loosening the focus lock thumbscrew and turning the fine focus guiding adapter. Firmly retighten the fine focus lock thumbscrew to secure the autoguider position.

**Warning:** Do not turn the fine focus guiding adapter more than two (2) full turns counter-clockwise, or the autoguider could fall off!

### Finding and Focusing a Guide Star

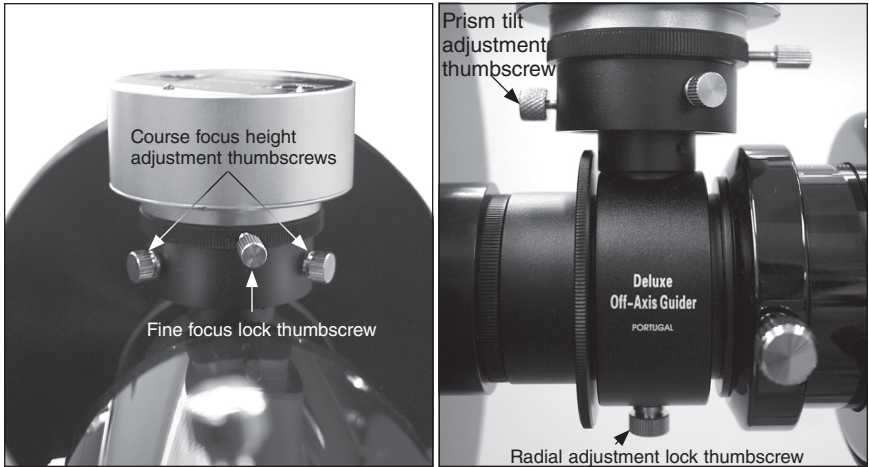
Finding a guide star can be challenging because the pick-off prism only intercepts a small portion of the focal plane to avoid interfering with the imaging camera's view. Please read the following procedure to best find and focus a guide star.

To find a guide star and focus with the Deluxe Off-Axis Guider:

1. Focus your imaging camera first. Use your telescope's focuser.

*Note: We highly recommend using an eyepiece to locate the guide star before the exact focus is found. This only needs to be done the first time you use the Deluxe Off-Axis Guider. Once you have achieved focus, you can keep the Deluxe Off-Axis Guider locked in the same focus position and skip steps 2-5. Once the autoguider is focused, it will be much easier to locate guide stars.*





**Figure 8a and 8b.** Guide star acquisition and focus adjustments are made by these thumbscrews

2. Insert a 1.25" eyepiece into the fine focus guiding adapter. Secure the eyepiece by tightening the socket head setscrew with the provided 1.5mm hex key (Figure 5). Locate a guide star through the guiding end of the Deluxe Off-Axis Guider using an eyepiece.
3. Unlock the radial adjustment lock thumbscrew and slowly rotate the autoguider until you see a guide star. If necessary, you can also use the prism tilt adjustment setscrew to help find a guide star (Figures 8a-8b).
4. If you can see a guide star in the eyepiece but the star is not focused, remove the eyepiece and connect your autoguider. It's time to focus on the guide star with your autoguider to start imaging! If you cannot find a guide star, refer to "I Can't Seem to Find a Guide Star!".
5. With your autoguider connected, use the coarse and fine focus adjustments on the guiding end of the Deluxe Off-Axis Guider. Do not adjust your telescope's focuser because that will disrupt your imaging camera's focus. Remember not to turn the fine focus guiding adapter more than two full turns counter-clockwise, or the autoguider could fall off!
6. Ensure that all setscrews are securely tightened, and be careful not to move the telescope or Deluxe Off-Axis Guider, as the guide star could drift away. Attach the autoguider if you have not already done so. You are ready to begin imaging.

*Note: If you cannot get the guide star to reach focus, try to determine if you need more inward or outward travel. You may need to add or remove one of the three included spacers to allow the autoguider to reach focus.*



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## **I Can't Seem to Find a Guide Star!**

Don't get discouraged if you cannot find a guide star at first. It can be challenging. But once you have focused your imager and autoguider, it will be far easier to locate a guide star. If necessary, move the telescope to a densely-populated and bright star field. An open star cluster would be ideal. This will improve your chances of finding a star through the Deluxe Off-Axis Guider to obtain an accurate focus before moving to the object you want to image.

We recommend keeping the Deluxe Off-Axis Guider focus position locked for future use. You can still remove all the components for storage, but the coarse and fine focus adjustments should stay locked in place. The next time you setup your Deluxe Off-Axis Guider, your autoguider will already be parfocal with the imaging camera, saving you significant setup time.

## **6. Care and Storage**

Be careful not to accidentally strike the delicate pick-off prism inside the guider. If necessary, you may use a cotton swab with cleaning solution (approved for multi-coated glass) to gently clean the surface of the prism.

The Deluxe Off-Axis Guider should be treated with care to last a lifetime. Store the Deluxe Off-Axis Guider in its original packaging when not in use.

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## One-Year Limited Warranty

This Orion product is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid. Proof of purchase (such as a copy of the original receipt) is required. This warranty is only valid in the country of purchase.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights. It is not intended to remove or restrict your other legal rights under applicable local consumer law; your state or national statutory consumer rights governing the sale of consumer goods remain fully applicable.

For further warranty information, please visit [www.OrionTelescopes.com/warranty](http://www.OrionTelescopes.com/warranty).



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